Printing and Mac OS X

Session 510

Printing and Mac OS X

Richard Blanchard
Printing

Thanks

Big Questions

- For example
  - Why we can not share our printers?
  - Where is the integration with the command line/UNIX?
  - Where is the accounting support?
  - Where does my custom RIP fit?

"It is not necessary to change;
Survival is not mandatory"

—*William Edwards Denning*

Big Changes

- New print spooler
- User interface changes

"A capacity to change is indispensable; Equally indispensable is the capacity to hold fast to that which is good"

—John Foster Dulles

Compatibility Is Key

- Extending, not replacing, the APIs
- Printer Dialog Extensions and Printer Modules continue to work
- Better documentation

New Print Spooler

- Common Unix Printing System
  - CUPS
- Why?

Some Big Answers

- Printer sharing
- Command line integration
  - BSD and System V commands
- Accounting
- RIP support

Other Goals

- Be a better team player
    - In labs
    - In corporations
    - In publishing house
- Be more transparent

Supporting Standards

- Internet Printing Protocol
  - IETF Standard from the IEEE Printer Working Group
- PostScript Printer Description Files
  - Adobe standard to describe printer capabilities
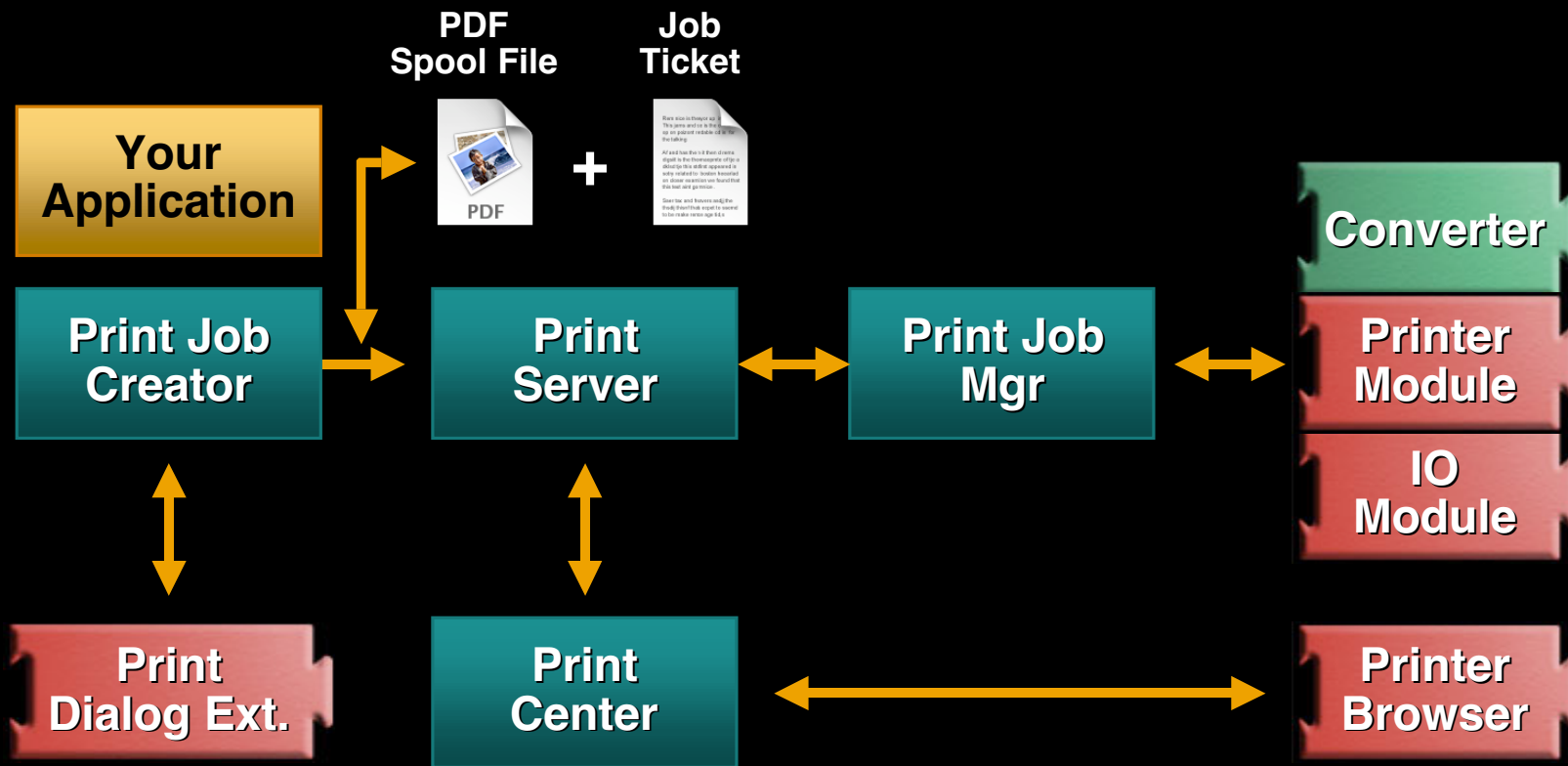 - Used for all printers
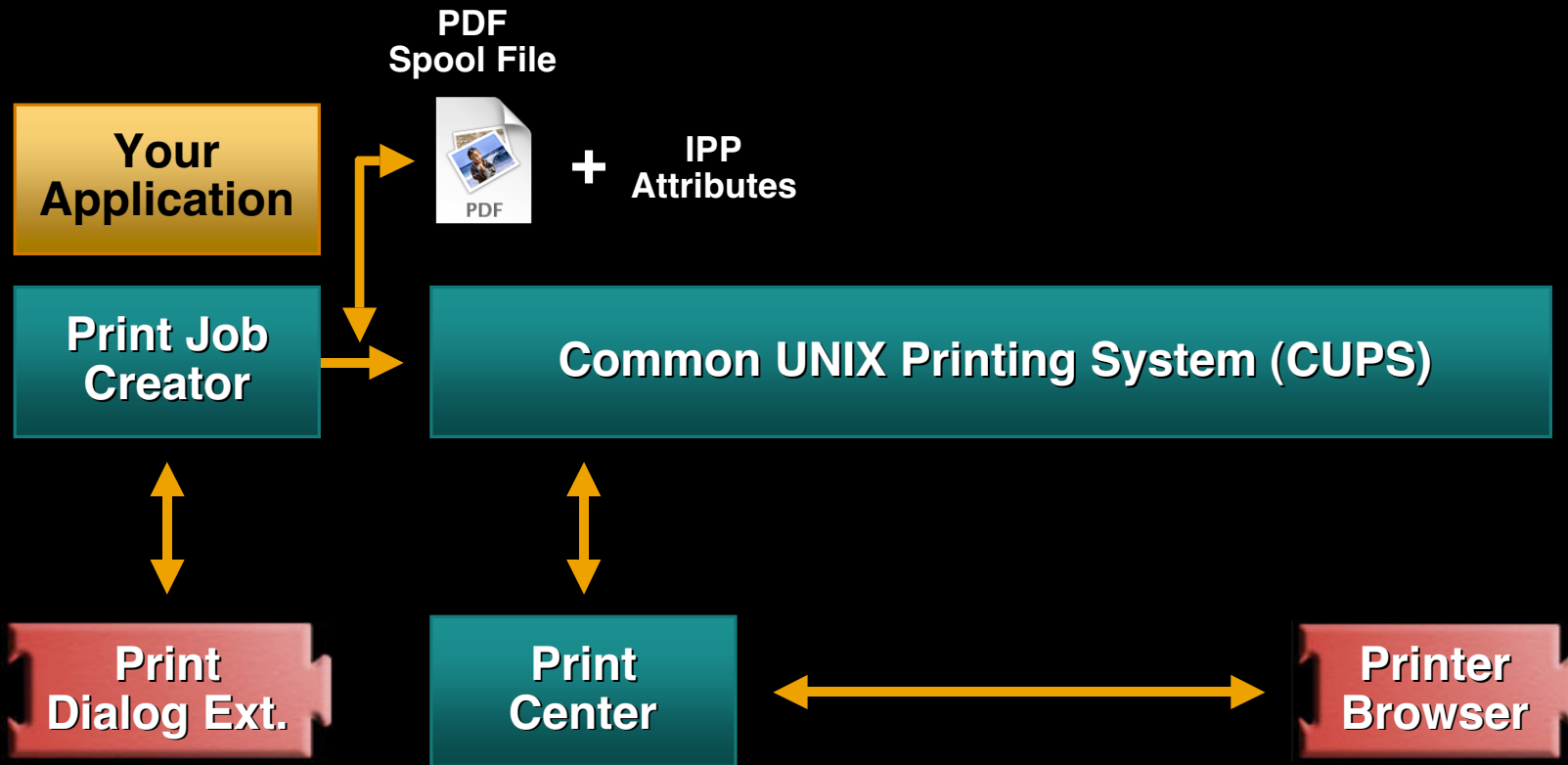
Being Well Understood

- CUPS is Open Source
    - Released under GPL
    - In Darwin
- Widely used on Linux Systems
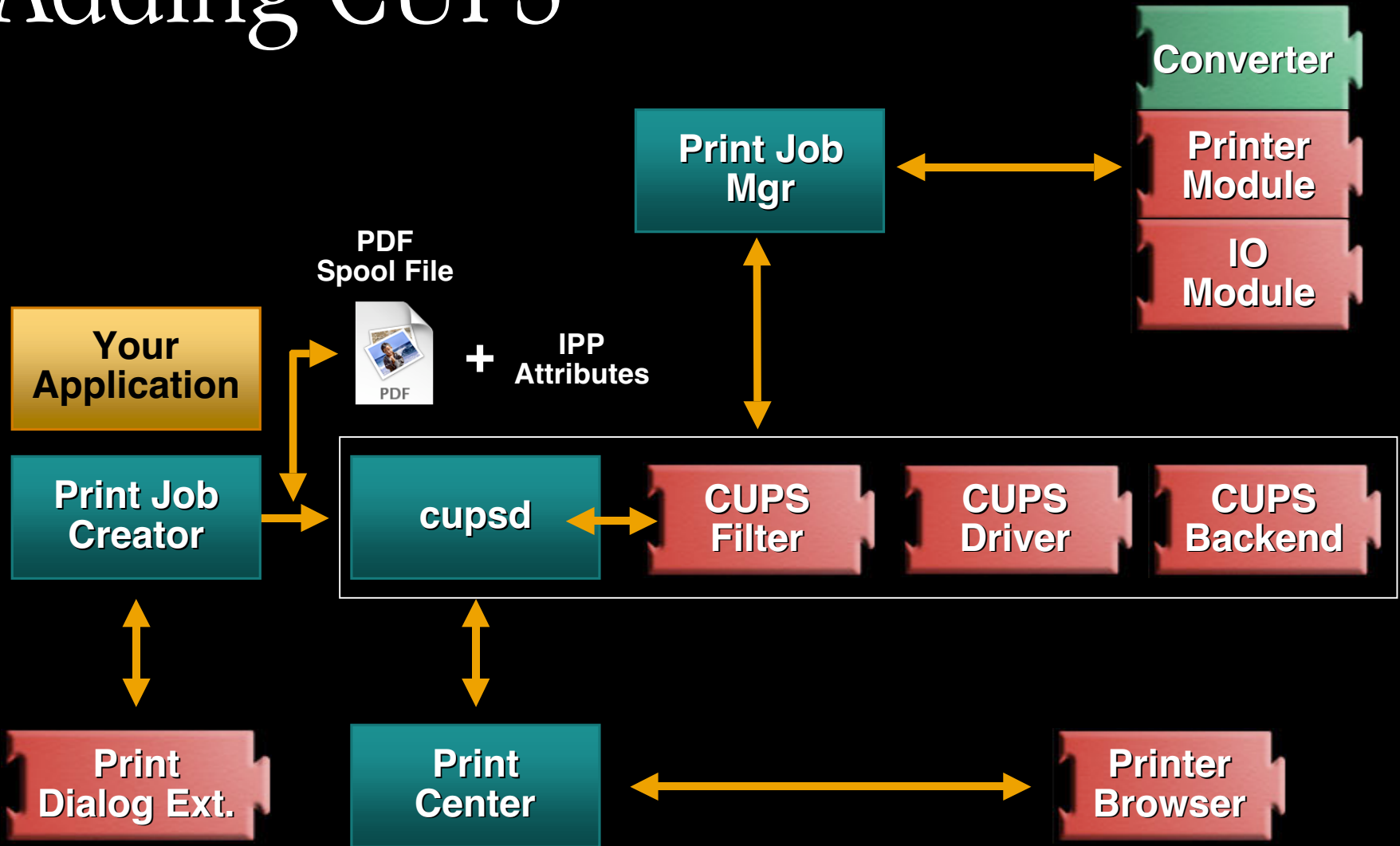- Also runs on AIX, FreeBSD, HP-UX, IRIX, Solaris
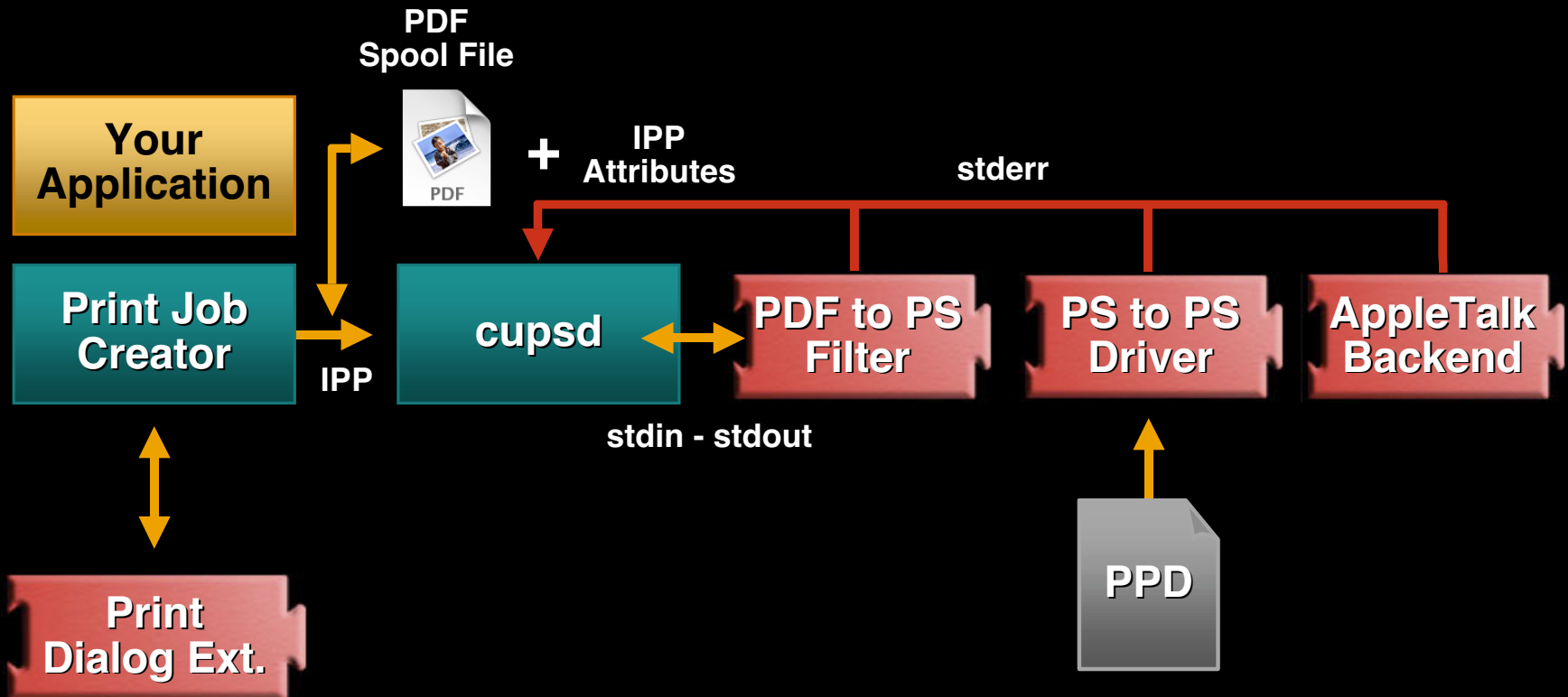
10.1 Printing System

Adding CUPS

**PDF
Spool File**

**Your
Application**

+

**IPP
Attributes**

**Print Job
Creator**

Common UNIX Printing System (CUPS)

**Print
Dialog Ext.**

**Print
Center**

**Printer
Browser**

Adding CUPS

Converter

Printer Module

IO Module

Print Job Mgr

PDF Spool File

Your Application

+ IPP Attributes

Print Job Creator

cupsd

CUPS Filter

CUPS Driver

CUPS Backend

Print Dialog Ext.

Print Center

Printer Browser

Printing Walkthrough

PDF Spool File

Your Application

+ **IPP Attributes**

stderr

Print Job Creator

IPP

cupsd

PDF to PS Filter

PS to PS Driver

AppleTalk Backend

stdin - stdout

Print Dialog Ext.

PPD

Adding CUPS

Converter

Printer Module

IO Module

Print Job Mgr

Your Application

PDF Spool File

+ **IPP Attributes**

Print Job Creator

IPP

cupsd

CUPS Filter

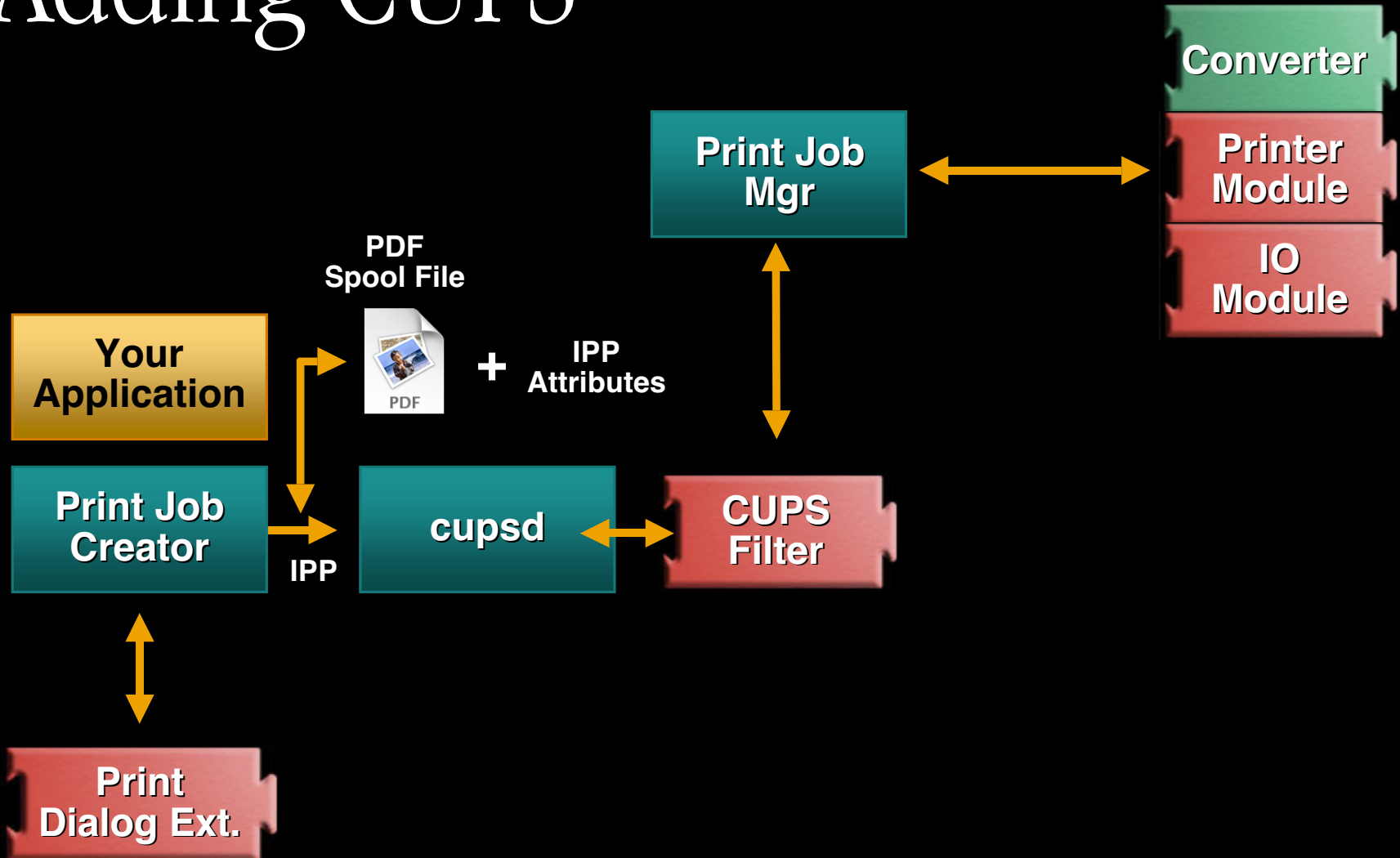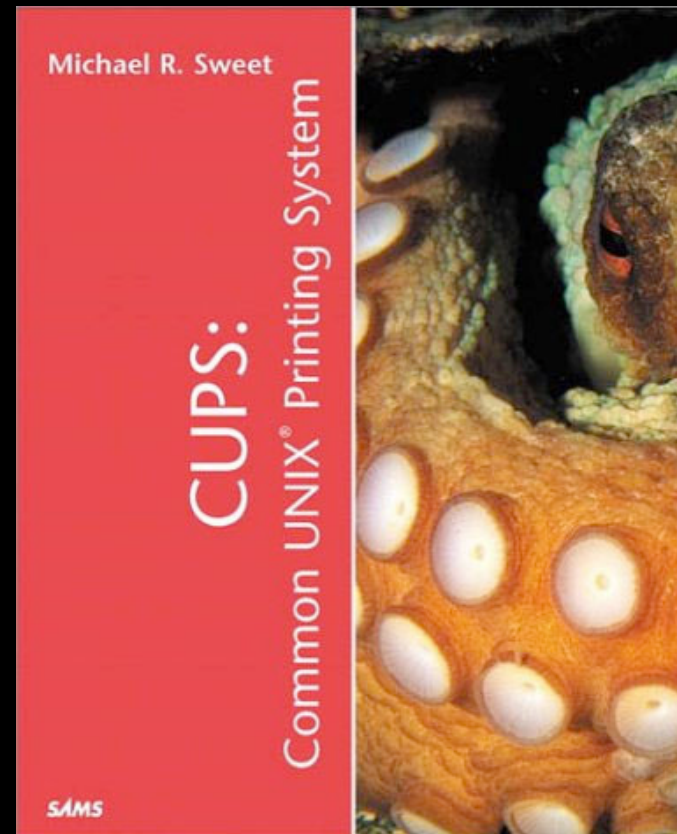**Print Dialog Ext.**

CUPS Features

- Not everything is exposed in the user interface
  - Authentication
  - Encryption
  - Quotas
  - Printer classes
  - Web administration
  - Lots more . . .

To Understand CUPS

- Get the book
- Watch the Darwin Printing session
- Study the online documentation
- Read the code!

Success Story

- Jaws PDF Library
  - "It was easy to integrate our existing libraries with CUPS on [Mac] OS X"
  - Elapsed Time: 2 Days
- Result: Print PostScript files to raster printers

Interesting Code Places

- cupsd.conf
  - Configures the print server
- Filters
  - PostScript RIPS
- Logs
  - Access, accounting, and errors
- gimp-print

Interesting Places Outside the Code

- **www.cups.org**

- **www.pwg.org**
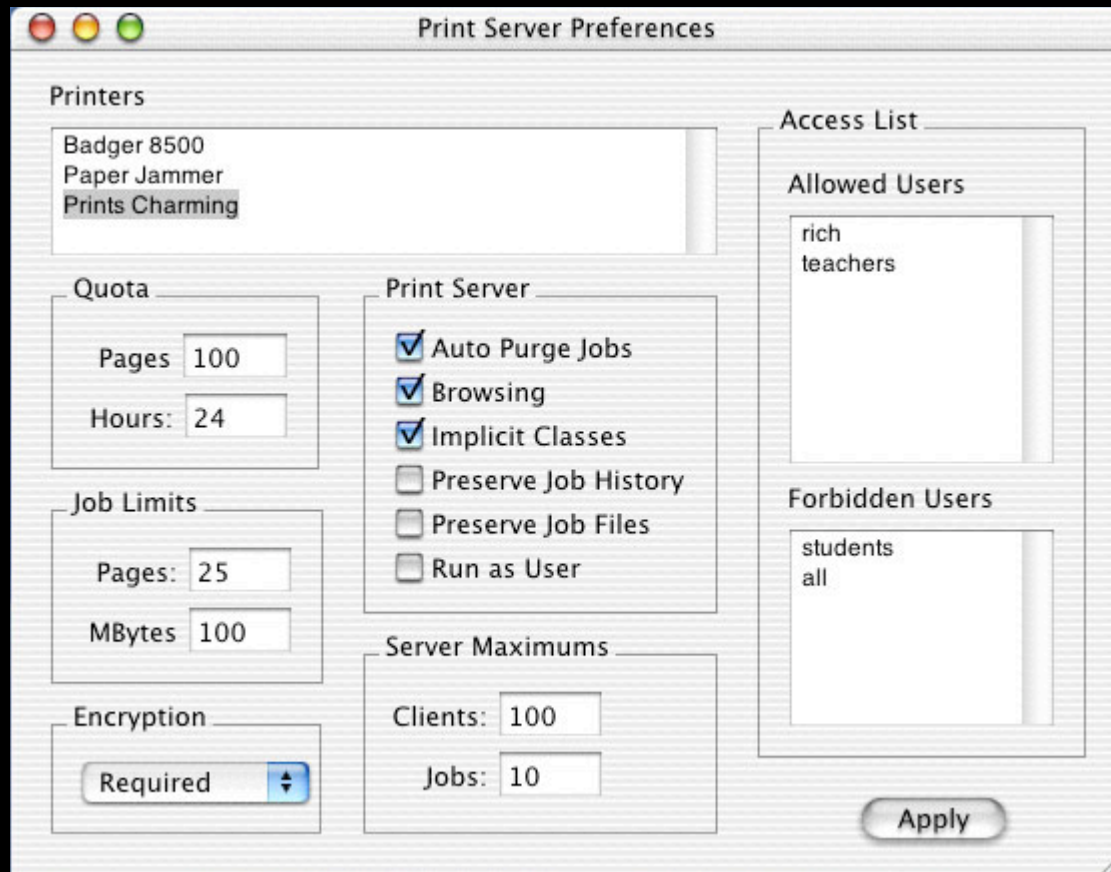
- **gimp-print.sourceforge.net**

User Interface Changes

"Power tends to corrupt and absolute power corrupts absolutely"

—Lord Acton

No!

User Interface Changes

- New Print Center
- New Printer Browsers
- Simple Print Dialog
- Presets

Cocoa Ad

- Print Center
  - Rewritten in Cocoa
    - 1/5 the code size
  - More features
  - User customizable

Demo

User Interface

Summary, So Far

- Big changes
  - New, open spooling system
  - User Interface
- Compatibility remains
  - Applications do not need to change
  - Printer Modules do not need to change

"The art of progress is to preserve order amid change and to preserve change amid order"

—Alfred Whitehead

Printing and Mac OS X

Paul Danbold
Printing Stooge, Graphics and Imaging

New APIs

- 'NoDialog' functions
- PMPrinter
- PMPreset

Suppressing the Spooling Dialog

```
PMSessionBeginDocumentNoDialog();

PMSessionBeginPageNoDialog();

PMSessionEndPageNoDialog();

PMSessionEndDocumentNoDialog();
```

PMPrinter Functions

PMServerCreatePrinterList(PMServer server, CFArrayRef *printerList);

PMPrinterGetName(PMPrinter printer)

PMPrinterGetID(PMPrinter printer);

PMPrinterGetLocation(PMPrinter printer);

PMPrinterIsDefault(PMPrinter printer);

PMPrinter Functions

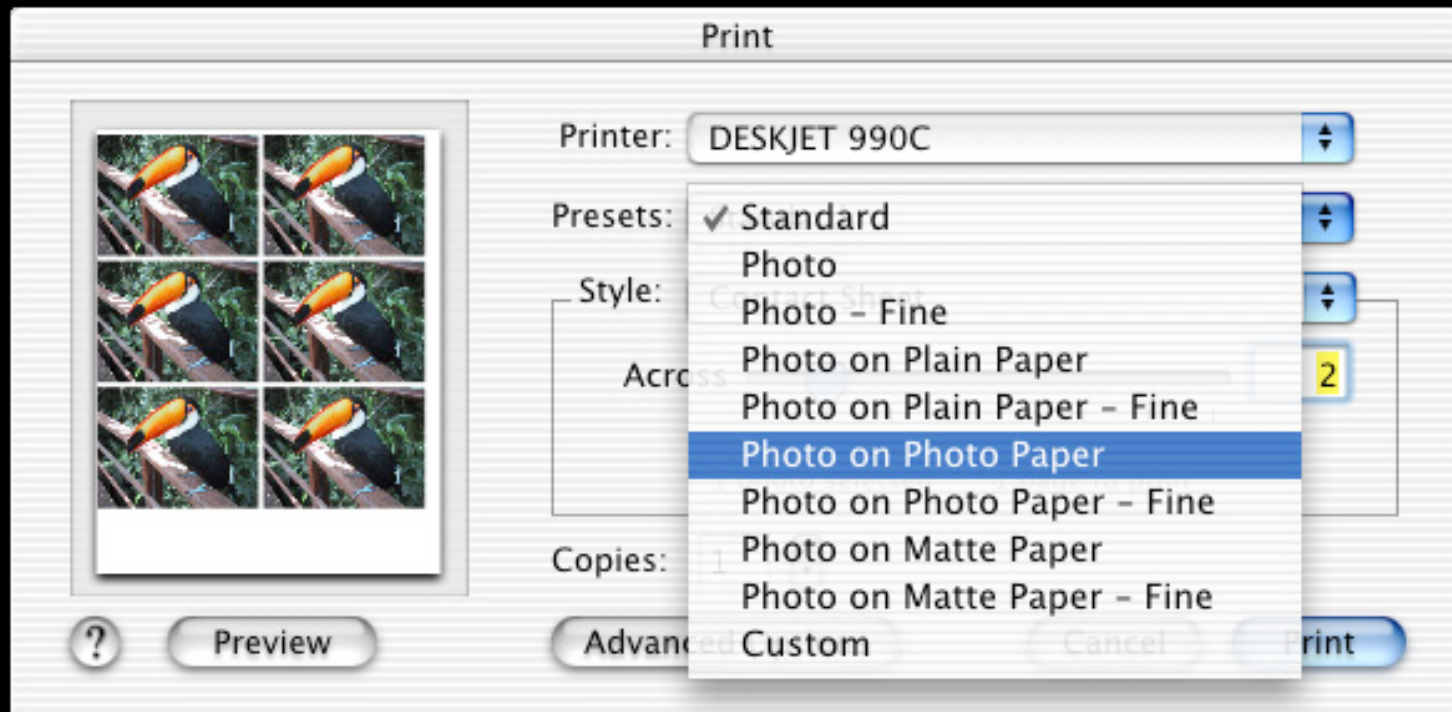**PMPrinterGetMakeAndModelName(PMPrinter printer, CFStringRef * makeAndModel);**

PMPrinterIsPostScriptCapable(PMPrinter printer);

PMPrinterGetState(PMPrinter printer, PMPrinterState *state);

Preset Functions

Preset Functions

PMSessionEnablePrinterPresets (PMPrintSession session, CFStringRef graphicsType);

PMSessionDisablePrinterPresets (PMPrintSession session);

Preset Functions

PMPrinterCopyPresets(PMPrinter printer, CFArrayRef *presetList);

PMPresetGetAttributes(PMPreset preset, CFDictionaryRef *attributes);

PMPresetCopyName(PMPreset preset, CFStringRef *name);

PMPresetCreatePrintSettings(PMPreset preset, PMPrintSession session, PMPrintSettings *printSettings);

Sample Code

- AppUsingSheets
- CarbonQuartzDrawingWPrinting
- CGDrawPicture
- PDEPrint

Demo

The Application Checklist

- Use the 'session' APIs
  - **PrintLoop** sample code

- Use sheets
  - **AppUsingSheets** sample code
  - **beginSheetWithPrintInfo** for Cocoa apps

- Use PDEs
  - **PDEPrint** Sample Code

Use the PDF Printing Path

- Only if you must, use the PictwPS path **PMSessionGetDocumentFormatGeneration** and **PMSessionSetDocumentFormatGeneration** (see the PrintLoop sample code)

- **QDBeginCGContext** and **QDEndCGContext** are better (see the CarbonQuartzDrawing-WPrinting sample code)

- Use **PMCGImageCreateWithEPSDataProvider** to handle EPS graphics

The Driver Checklist

The Driver Checklist

- Presets

  - For iPhoto and applications that call **PMSessionEnablePrinterPresets**

- ColorSync profiles

  - Provide profiles for all your supported paper types and print quality modes

  - Register your profiles

The Driver Checklist (Cont.)

- Make your printer utility known to Print Center
  - Include a PMUtilityURL key in your Info.plist file
- Use makequeues in your Installer to refresh USB printer queues
  - **makequeues -r**

The Driver Checklist (Cont.)

- Keep custom IOMs to a minimum
  - USB and LPR source code available from DTS
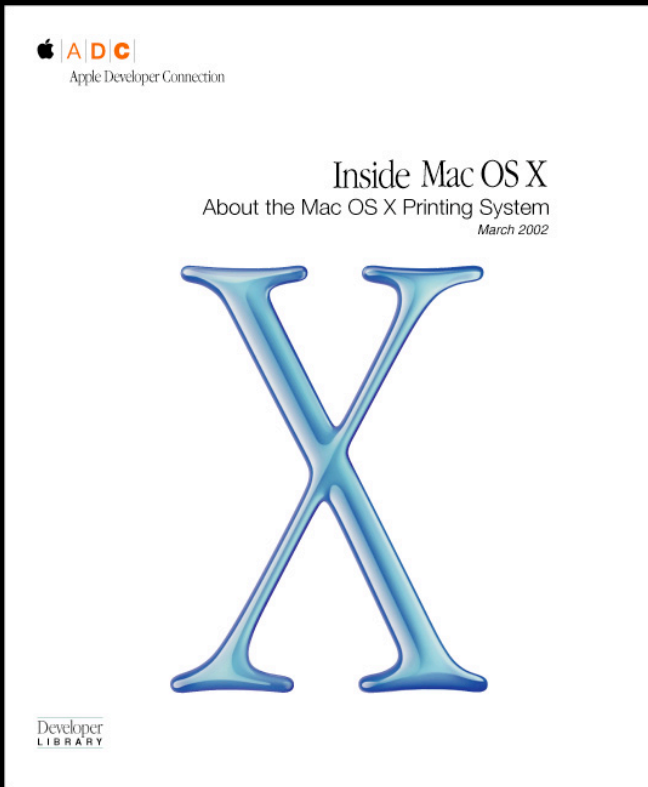- Consider CUPS drivers when Jaguar ships

USB and Printing

- Printing Class Driver
- Support for more DeviceID keys
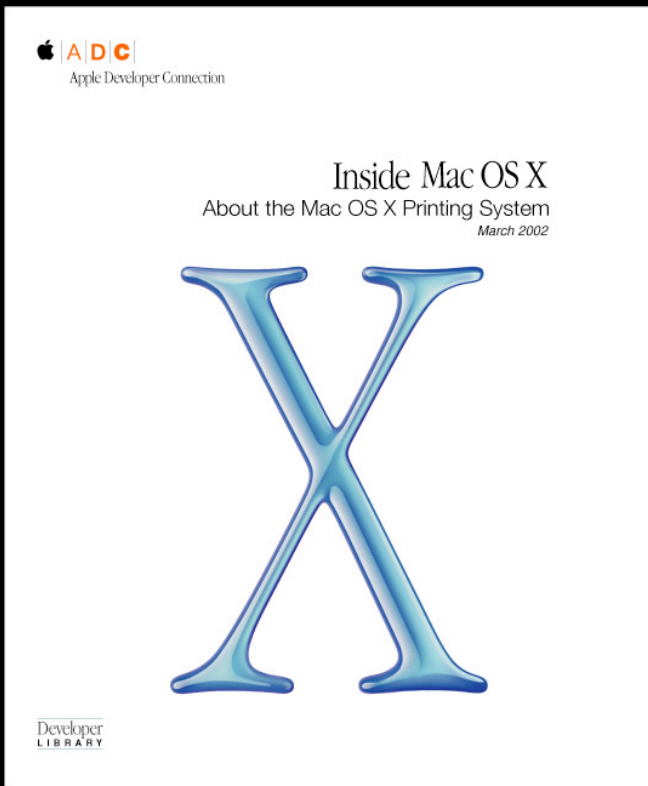- Set Alternate Interface

Documentation

Printing

Inside Mac OS X
About the Mac OS X Printing System
March 2002

- About the Mac OS X Printing System

- Cocoa Printing

- Using PostScript Printer Description Files

- Extending Printing Dialogs

Documentation > Core Technologies > Graphics > Mac OS X Printing
developer.apple.com/techpubs/macosx/CoreTechnologies/graphics/Printing/printing.html

More Documentation

Printing

- Supporting Printing in Your Carbon Application

- Carbon Printing Manager Reference

- Creating Printing Presets for iPhoto

More Documentation

Printing

- Printing Plug-In Interfaces Reference
- Ticket Services Reference

  Documentation > Core Technologies > Graphics > Mac OS X Printing
  developer.apple.com/techpubs/macosx/CoreTechnologies/graphics/Printing/printing.html

- Technical Notes: Printing

  developer.apple.com/technotes/index.html
- Technical Q&A's: Printing

  developer.apple.com/qa/index.html

Summary

- CUPS (printer sharing, better printing services for Unix, extensibility and compatibility)

- Cocoa Print Center

- New APIs (no dialog, PMPrinter, PMPreset)

- New Sample Code (AppUsingSheets, CarbonQuartzDrawing, PDE Print)

- New documentation

"We will move forward, we will move upward, and yes, we will move onward."

"If we do not succeed, then we run the risk of failure."

Dan Quayle

Roadmap

500 Graphics and Imaging Overview	Room A2	**Tue., 10:30am**
501 Quartz 2D and PDF	Room A2	**Tue., 2:00pm**
503 Exploring the Quartz Compositor	Hall 2	**Tue., 3:30pm**
504 OpenGL: Graphics Programmability	Room A2	**Tue., 5:00pm**

Roadmap

505 OpenGL: Integrated Graphics I	Room J	**Wed., 9:00am**
506 OpenGL: Integrated Graphics II	Room J	**Wed., 10:30am**
109 Darwin Printing	Room J	**Wed., 2:00pm**
509 ColorSync and Digital Media	Room C	**Wed., 5:00pm**

Roadmap

510 Printing and Mac OS X	Hall 2	**Thurs., 10:30am**
513 OpenGL: Advanced 3D	Room J	**Thurs., 3:30pm**
514 OpenGL: Performance and Optimization	Room J	**Thurs., 5:00pm**
515 Image Capture Framework	Room C	**Fri., 2:00pm**

Roadmap

516 Graphics and Imaging Performance Tuning

Hall 2
Fri., 3:30pm

FF018: Graphics an Imaging

Room J1
Fri., 5:00pm
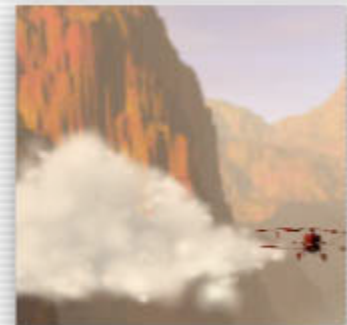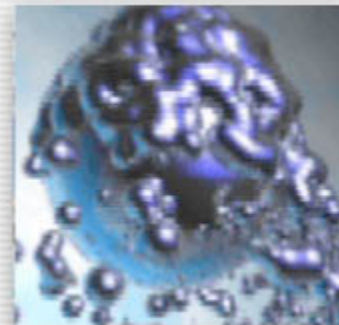
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http://developer.apple.com/wwdc2002/urls.html